OIPE
AUG 15 2007
PATENT & TRADEMARK OFFICE

SEQUENCE LISTING

<110> Large Scale Biology Corporation

<120> POPULATION OF POLYNUCLEOTIDE SEQUENCE VARIANTS

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<150> 60/402,342
<151> 2002-08-08

<150> 10/066,390
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cattatcaac aaaatactcc aattggcgat ggccctgtcc ttttaccaga caaccattac   600

ctgtccacac aatctgccct ttcgaaagat cccaacgaaa agagagacca catggtcctt   660

cttgagtttg taacagctgc tgggattaca catggcatgg atgaactata caaataa   717

<210> 9
<211> 807
<212> DNA
<213> Tobacco mosaic virus

<400> 9
atggctctag ttgttaaagg aaaagtgaat atcaatgagt ttatcgacct gacaaaaatg   60

gagaagatct taccgtcgat gtttacccct gtaaagagtg ttatgtgttc caaagttgat   120

aaaataatgg ttcatgagaa tgagtcattg tcaggggtga accttcttaa aggagttaag   180

cttattgata gtggatacgt ctgtttagcc ggtttggtcg tcacgggcga gtggaacttg   240

cctgacaatt gcagaggagg tgtgagcgtg tgtctggtgg acaaaaggat ggaaagagcc   300

gacgaggcca ctctcggatc ttactacaca gcagctgcaa agaaaagatt tcagttcaag   360

gtcgttccca attatgctat aaccacccag gacgcgatga aaaacgtctg gcaagtttta   420

gttaatatta gaaatgtgaa gatgtcagcg ggtttctgtc cgctttctct ggagtttgtg   480

tcggtgtgta ttgtttatag aaataatata aaattaggtt tgagagagaa gattacaaac   540

gtgagagacg gagggcccat ggaacttaca gaagaagtcg ttgatgagtt catggaagat   600

gtccctatgt cgatcaggct tgcaaagttt cgatctcgaa ccggaaaaaa gagtgatgtc   660

cgcaaaggga aaaatagtag tagtgatcgg tcagtgccga acaagaacta tagaaatgtt   720

aaggattttg gaggaatgag ttttaaaaag aataatttaa tcgatgatga ttcggaggct   780

actgtcgccg aatcggattc gttttaa   807

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<210>  10
<211>  793
<212>  DNA
<213>  Tomato mosaic virus

<400>  10
atggctctag ttgttaaagg taaggtaaat attaatgagt ttatcgatct gtcaaagtct     60

gagaaacttc tcccgtcgat gttcacgcct gtaaagagtg ttatggtttc aaaggttgat    120

aagattatgg tccatgaaaa tgaatcattg tctgaagtaa atctcttaaa aggtgtaaaa    180

cttatagaag gtgggtatgt ttgcttagtt ggtcttgttg tgtccggtga gtggaattta    240

ccagataatt gccgtggtgg tgtgagtgtc tgcatggttg acaagagaat ggaaagagcg    300

gacgaagcca cactggggtc atattacact gctgctgcta aaaagcggtt tcagtttaaa    360

gtggtcccaa attacggtat tactacaaag gatgcagaaa agaacatatg gcaggtctta    420

gtaaatatta aaaatgtaaa aatgagtgcg ggctactgcc ctttgtcatt agaatttgtg    480

tctgtgtgta ttgtttataa aaataatata aaattgggtt tgagggagaa agtaacgagt    540

gtgaacgatg gaggacccat ggaactttca gaagaagttg ttgatgagtt catggagaat    600

gttccaatgt cggttagact cgcaaagttt cgaaccaaat cctcaaaaag aggtccgaaa    660

aataataata atttaggtaa ggggcgttca ggcggaaggc ctaaaccaaa aagttttgat    720

gaagttgaaa aagagtttga taatttgatt gaagatgaag ccgagacgtc ggtcgcggat    780

tctgattcgt att                                                       793


<210>  11
<211>  795
<212>  DNA
<213>  Artificial Sequence

<220>
<223>   Derived from tobacco mosaic virus & tomato mosaic virus by
        GRAMMR shuffling in accordance with the methodogy of the
        present invention.

<400>  11
atggctctag ttgttaaagg taaggtaaat attaatgagt ctatcgatct gtcaaagtct     60

gagaaacttc tcccgtcgat gttcacgcct gtaaagagtg ttatggtttc aaaggttgat    120

aagattatgg tccatgaaaa tgaatcattg tctgaagtaa atctcttaaa aggtgtaaaa    180

cttatagaag gtgggtatgt ttgcttagtt ggtcttgttg tgtccggtga gtggaattta    240

ccagataatt gccgtggtgg tgtgagtgtc tgcatggttg acaagagaat ggaaagagcg    300

gacgaagcca cactggggtc atattacact gctgctgcta aaaagcggtt tcagttcaag    360

gtcgttccca attatgctat aaccacccag gatgcagaaa agaacatatg gcaggtctta    420

gtaaatatta aaaatgtaaa aatgagtgcg ggctactacc ctttgtcatt agaatttgtg    480
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tctgtgtgta ttgtttataa aaataatata aaattgggtt tgagggagaa agtaacgagt    540

gtgaacgatg gaggacccat ggaactttca gaagaagttg ttgatgagtt catggagaat    600

gttccaatgt cgatcaggct tgcaaagttt cgaaccaaat cctcaaaaag aggtccgaaa    660

aataataata atttaggtaa ggggcgttca ggcggaaggc ctaaaccaag aagttttgat    720

gaagttgaaa aagagtttga taatttgatt gaagatgaag ccgagacgtc ggtcgcggat    780

tctgattcgt attaa                                                     795


<210>  12
<211>  795
<212>  DNA
<213>  Artificial Sequence

<220>
<223>   Derived from tobacco mosaic virus & tomato mosaic virus by
        GRAMMR shuffling in accordance with the methodogy of the
        present invention.

<400>  12
atggctctag ttgttaaagg taaggtaaat attaatgagt ttatcgatct gtcaaagtct     60

gagaaacttc tcccgtcgat gttcacgcct gtaaagagtg ttatggtttc aaaggttgat    120

aagattatgg tccatgaaaa tgaatcattg tctgaagtaa atctcttaaa aggtgtaaaa    180

cttatagaag gtgggtatgt ttgcttagtt ggtcttgttg tgtccggtgt gtggaattta    240

ccagataatt gccgtggtgg tgtgagtgtc tgcatggttg acaagagaat ggaaagagcg    300

gacgaggcca cactcggatc ttactacact gctgctgcta aaaagcggtt tcagttcaag    360

gtcgttccca attatgctat aaccacccag gatgcagaaa agaacatatg gcaggtctta    420

gtaaatatta aaaatgtaaa aatgagtgcg ggctactgcc ctttgtcatt agaatttgtg    480

tctgtgtgta ttgtttataa aaataatata aaattgggtt tgagggagaa agtaacgagt    540

gtgaacgatg gaggacccat ggaactttca gaagaagttg ttgatgagtt catggagaat    600

gttccaatgt cggttagact cgcaaagttt cgaaccaaat cctcaaaaag aggtccgaaa    660

aataataata atttaggtaa ggggcgttca ggcggaaggc ctaaaccaaa aagttttgat    720

gaagttggaa aagagtttga taatttgatt gaagatgaag ccgagacgtc ggtcgcggat    780

tctgattcgt attaa                                                     795


<210>  13
<211>  795
<212>  DNA
<213>  Artificial Sequence

<220>
<223>   Derived from tobacco mosaic virus & tomato mosaic virus by
        GRAMMR shuffling in accordance with the methodogy of the
        present invention.
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<400> 13
atggctctag ttgttaaagg taaggtaaat attaatgagt ttatcgatct gtcaaagtct 60

gagaaacttc tcccgtcgat gttcacgcct gtaaggagtg ttatggtttc aaaggttgat 120

aagattatgg tccatgaaaa tgaatcattg tctgaagtaa atctcttaaa aggtgtaaaa 180

cttatagaag gtgggtatgt ttgcttagtt ggtcttgttg tgtccggtga gtggaattta 240

ccagataatt gccgtggtgg tgtgagtgtc tgcatggttg acaagagaat ggaaagagcg 300

gacgaagcca cactggggtc atattacact gctgctgcta aaaagcggtt tcagtttaaa 360

gtggtcccaa attacggtat tactacccag gacgcgatga aaaacgtctg gcaggtctta 420

gtaaatatta aaaatgtaaa aatgagtgcg ggctactgcc ctttgtcatt agaatttgtg 480

tctgtgtgta ttgtttataa aaataatata aaattgggtt tgagggagaa agtaacgagt 540

gtgaacgatg gaggacccat ggaactttca gaagaagttg ttgatgagtt catggagaat 600

gttccaatgt cgatcagact cgcaaagttt cgaaccaaat cctcaaaaag aggtccgaaa 660

aataataata atttaggtaa ggggcgttca ggcggaaggc ctaaaccaaa aagttttgat 720

gaagttgaaa aagagtttga taatttgatt gaagatgaag ccgagacgtc ggtcgcggat 780

tctgattcgt attaa 795

<210> 14
<211> 796
<212> DNA
<213> Artificial Sequence

<220>
<223> Derived from tobacco mosaic virus & tomato mosaic virus by GRAMMR shuffling in accordance with the methodogy of the present invention.

<400> 14
atggctctag ttgttaaagg taaggtaaat attaatgagt ttatcgatct gtcaaagtct 60

gagaaacttc tcccgtcgat gttcacgcct gtaaagagtg ttatggtttc aaaggttgat 120

aagattatgg tccatgaaaa tgaatcattg tctgaagtaa atctcttaaa aggtgttaag 180

cttattgata gtggatacgt ctgtttagcc ggtttggtcg tcacgggcga gtggaattta 240

ccagataatt gccgtggtgg tgtgagtgtc tgcatggttg acaagagaat ggaaagagcg 300

gacgaagcca cactggggtc atattacact gctgctgcta aaaagcggtt tcagttcaag 360

gtcgttccca aattacggta ttactaccca ggatgcagaa aagaacatat ggcaggtctt 420

agtaaatatt aaaaatgtaa aaatgagtgc gggctactgc ccgctttctc tggagtttgt 480

gtctgtgtgt attgtttata aaaataatat aaaattgggt ttgagggaga aagtaacgag 540

tgtgaacgat ggaggaccca tggaactttc agaagaagtt gttgatgagt tcatggagaa 600

tgttccaatg tcggttagac tcgcaaagtt tcgaaccaaa tcctcaaaaa gaggtccgaa 660 aaataataat aatttaggta aggggcgttc aggcggaagg cctaaaccaa aaagttttga 720

tgaagttgaa aaagagtttg ataatttgat tgaggatgat tcggaggcta ctgtcgccga 780

ttctgattcg tattaa 796

<210> 15
<211> 795
<212> DNA
<213> Artificial Sequence

<220>
<223> Derived from tobacco mosaic virus & tomato mosaic virus by GRAMMR shuffling in accordance with the methodogy of the present invention.

<400> 15
atggctctag ttgttaaagg aaaagtgaat attaatgagt ttatcgatct gtcaaagtct 60

gagaaacttc tcccgtcgat gttcacgcct gtaaagagtg ttatggtttc aaaggttgat 120

aagattatgg tccatgaaaa tgaatcattg tctgaagtaa atctcttaaa aggtgtaaaa 180

cttatagaag gtgggtatgt ttgcttagtt ggtcttgttg tgtccggcga gtggaattta 240

ccagataatt gccgtggtgg tgtgagtgtc tgcatggttg acaagagaat ggaaagagcg 300

gacgaagcca cactggggtc atattacact gctgctgcaa agaaaagatt tcagttcaag 360

gtcgttccca attatgctat aaccacccag gatgcagaaa agaacatatg gcgggtctta 420

gtaaatatta aaaatgtaaa aatgagtgcg ggctactgcc cgctttctct ggagtttgtg 480

tctgtgtgta ttgtttataa aaataatata aaattgggtt tgagggagaa agtaacgagt 540

gtgaacgatg aaggacccat ggaactttca gaagaagttg ttgatgagtt catggagaat 600

gttccaatgt cgatcaggct cgcaaagttt cgaaccaaat cctcaaaaag aggtccgaaa 660

aataataata atttaggtaa ggggcgttca ggcggaaggc ctaaaccaaa aagttttgat 720

gaagttgaaa aagagtttga taatttgatt gaagatgaag ccgagacgtc ggtcgcggat 780

tctgattcgt actaa 795

<210> 16
<211> 888
<212> DNA
<213> Selaginella lepidophylla

<400> 16
atggcaacga ccaagacgag cgggatggcg ctggctttgc tcctcgtcgc cgccctggcc 60

gtgggagctg cggcctgggg gaaagagggc catcgcctca cttgtatggt cgccgagccc 120

tttctaagct ctgaatccaa gcaagctgtg gaggagcttc tctctggaag agatctcccg 180

gacttgtgtt catgggccga tcagattcga agatcgtata agtttagatg gactggtcct 240

ttgcactaca tcgatactcc agacaacctc tgcacctatg actatgatcg tgactgccac 300 gattcccatg ggaagaagga cgtgtgtgtc gctggtggga tcaacaatta ctcgtcgcag 360

ctggaaacgt ttctagattc agagagctcg tcgtataact tgaccgaggc gctgctcttc 420

ctggctcact ttgtcgggga tatacaccag cccttgcacg tagcatttac gagtgatgcc 480

ggaggcaatg gcgtgcacgt ccgctggttt ggacgaaagg ccaacttgca tcacgtctgg 540

gatacagaat ttatttctag agccaatcgt gtgtactacc acgacatttc caagatgctc 600

cggaacatta ccaggagcat aactaagaag aatttcaata gttggagcag atgtaagact 660

gatccggcgg cttgtattga tagttatgcg acagaaagta tagatgcttc ttgcaactgg 720

gcatacaaag acgcacccga cggaagctct ctagatgatg attacttctc ttcacgcctt 780

ccaattgttg agcagcgtct tgctcaaggg ggcgtcaggc tggcgtcaat actcaacagg 840

atttttggag gagcaaagtc gaacaggtcc agtcgctcaa gcatgtag 888

<210> 17
<211> 3637
<212> DNA
<213> Artificial Sequence

<220>
<223> Encodes cycle 3 GFP

<400> 17
gtggcacttt tcggggaaat gtgcgcggaa cccctatttg tttatttttc taaatacatt 60

caaatatgta tccgctcatg agacaataac cctgataaat gcttcaataa tattgaaaaa 120

ggaagagtat gagtattcaa catttccgtg tcgcccttat tccctttttt gcggcatttt 180

gccttcctgt ttttgctcac ccagaaacgc tggtgaaagt aaaagatgct gaagatcagt 240

tgggtgcacg agtgggttac atcgaactgg atctcaacag cggtaagatc cttgagagtt 300

ttcgccccga agaacgtttt ccaatgatga gcacttttaa agttctgcta tgtggcgcgg 360

tattatcccg tattgacgcc gggcaagagc aactcggtcg ccgcatacac tattctcaga 420

atgacttggt tgagtactca ccagtcacag aaaagcatct tacggatggc atgacagtaa 480

gagaattatg cagtgctgcc ataaccatga gtgataacac tgcggccaac ttacttctga 540

caacgatcgg aggaccgaag gagctaaccg cttttttgca caacatgggg gatcatgtaa 600

ctcgccttga tcgttgggaa ccggagctga atgaagccat accaaacgac gagcgtgaca 660

ccacgatgcc tgtagcaatg gcaacaacgt tgcgcaaact attaactggc gaactactta 720

ctctagcttc ccggcaacaa ttaatagact ggatggaggc ggataaagtt gcaggaccac 780

ttctgcgctc ggcccttccg gctggctggt ttattgctga taaatctgga gccggtgagc 840

gtgggtctcg cggtatcatt gcagcactgg ggccagatgg taagccctcc cgtatcgtag 900

ttatctacac gacggggagt caggcaacta tggatgaacg aaatagacag atcgctgaga 960

taggtgcctc actgattaag cattggtaac tgtcagacca agtttactca tatatacttt 1020

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agattgattt aaaacttcat ttttaattta aaaggatcta ggtgaagatc ctttttgata    1080
atctcatgac caaaatccct taacgtgagt tttcgttcca ctgagcgtca gaccccgtag    1140
aaaagatcaa aggatcttct tgagatcctt tttttctgcg cgtaatctgc tgcttgcaaa    1200
caaaaaaacc accgctacca gcggtggttt gtttgccgga tcaagagcta ccaactcttt    1260
ttccgaaggt aactggcttc agcagagcgc agataccaaa tactgtcctt ctagtgtagc    1320
cgtagttagg ccaccacttc aagaactctg tagcaccgcc tacatacctc gctctgctaa    1380
tcctgttacc agtggctgct gccagtggcg ataagtcgtg tcttaccggg ttggactcaa    1440
gacgatagtt accggataag gcgcagcggt cgggctgaac ggggggttcg tgcacacagc    1500
ccagcttgga gcgaacgacc tacaccgaac tgagatacct acagcgtgag ctatgagaaa    1560
gcgccacgct tcccgaaggg agaaaggcgg acaggtatcc ggtaagcggc agggtcggaa    1620
caggagagcg cacgagggag cttccagggg gaaacgcctg gtatctttat agtcctgtcg    1680
ggtttcgcca cctctgactt gagcgtcgat ttttgtgatg ctcgtcaggg gggcggagcc    1740
tatggaaaaa cgccagcaac gcggcctttt tacggttcct ggccttttgc tggccttttg    1800
ctcacatgtt ctttcctgcg ttatcccctg attctgtgga taaccgtatt accgcctttg    1860
agtgagctga taccgctcgc cgcagccgaa cgaccgagcg cagcgagtca gtgagcgagg    1920
aagcggaaga gcgcccaata cgcaaaccgc ctctccccgc gcgttggccg attcattaat    1980
gcagctggca cgacaggttt cccgactgga aagcgggcag tgagcgcaac gcaattaatg    2040
tgagttagct cactcattag gcaccccagg ctttacactt tatgcttccg gctcgtatgt    2100
tgtgtggaat tgtgagcgga taacaatttc acacaggaaa cagctatgac catgattacg    2160
ccaagcgcgc aattaaccct cactaaaggg aacaaaagct gggtaccgat gagtaaagga    2220
gaagaacttt tcactggagt tgtcccaatt cttgttgaat tagatggtga tgttaatggg    2280
cacaaatttt ctgtcagtgg agagggtgaa ggtgatgcta catacggaaa gcttaccctt    2340
aaatttattt gcactactgg aaaactacct gttccatggc caacacttgt cactactttc    2400
tcttatggtg ttcaatgctt ttcccgttat ccggatcata tgaaacggca tgactttttc    2460
aagagtgcca tgcccgaagg ttatgtacag gaacgcacta tatctttcaa agatgacggg    2520
aactacaaga cgcgtgctga agtcaagttt gaaggtgata cccttgttaa tcgtatcgag    2580
ttaaaaggta ttgattttaa agaagatgga aacattctcg gacacaaact cgagtacaac    2640
tataactcac acaatgtata catcacggca gacaaacaaa agaatggaat caaagctaac    2700
ttcaaaattc gccacaacat tgaagatgga tccgttcaac tagcagacca ttatcaacaa    2760
aatactccaa ttggcgatgg ccctgtcctt ttaccagaca accattacct gtcgacacaa    2820
tctgcccttt cgaaagatcc caacgaaaag cgtgaccaca tggtccttct tgagtttgta    2880
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actgctgctg ggattacaca tggcatggat gaactataca aataagaatt cctgcagccc 2940

gggggatcca ctagttctag agcggccgcc accgcggtgg agctccaatt cgccctatag 3000

tgagtcgtat tacgcgcgct cactggccgt cgttttacaa cgtcgtgact gggaaaaccc 3060

tggcgttacc caacttaatc gccttgcagc acatccccct ttcgccagct ggcgtaatag 3120

cgaagaggcc cgcaccgatc gcccttccca acagttgcgc agcctgaatg gcgaatggga 3180

cgcgccctgt agcggcgcat taagcgcggc gggtgtggtg gttacgcgca gcgtgaccgc 3240

tacacttgcc agcgccctag cgcccgctcc tttcgctttc ttcccttcct ttctcgccac 3300

gttcgccggc tttccccgtc aagctctaaa tcgggggctc cctttagggt tccgatttag 3360

tgctttacgg cacctcgacc ccaaaaaact tgattagggt gatggttcac gtagtgggcc 3420

atcgccctga tagacggttt ttcgcccttt gacgttggag tccacgttct ttaatagtgg 3480

actcttgttc caaactggaa caacactcaa ccctatctcg gtctattctt ttgatttata 3540

agggattttg ccgatttcgg cctattggtt aaaaaatgag ctgatttaac aaaaatttaa 3600

cgcgaatttt aacaaaatat taacgcttac aatttag 3637

<210> 18
<211> 796
<212> DNA
<213> Tobamovirus Cg

<400> 18
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cccaaggctc ttacgaggtt aaagactgtc tctattagta ctaaggatgt tatatctgtt 120

aaggattctg agtccctgtg tgatatagat ttactagtta atgtgccatt agataagtat 180

agatatgtgg gtgttttagg tgttgttttt accggtgagt ggttagtgcc ggatttcgtt 240

aaaggtggag taacagtgag cgtgattgac aaacggcttg agaactccaa agagtgcata 300

attggtacgt acagagctgc tgcgaaagac aaaaggttcc agttcaagct ggttccaaat 360

tacttcgtgt ctgttgcaga tgccaagcga aaaccgtggc aagttcatgt gcgtattcaa 420

aatttaagga ttgaagctgg atggcaacct ctggccttag aggtggtttc tgttgctatg 480

gtcactaata acgtggttgt taagggtttg agagaaaagg tcatcgcagt gaatgatccg 540

aatgtcgaag gtttcgaagg cgtggttgac gatttcgtcg attcggtcgc agcattcaag 600

gcggttgaca ctttcagaaa gaaaaagaaa aggattggag gaaaggatgt aaataataat 660

aagtttagat atagaccgga gagatacgcc ggtcaggatt cgttaaatta taaagaagaa 720

aacgtcttac aacatcacga actcgaatca gtaccagtat ttcgcagcga cgtgggcaga 780

gcccacagcg atgctt 796

<210> 19

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<211>  823
<212>  DNA
<213>  Tobamovirus Ob

<400>  19
atgtcaaagg ctattgtcaa gatcgatgaa ttcattaaat tatccaagtc tgaagaggtt      60

ttaccttctg cattcacaag aatgaagtcg gtcagagtct caacagtgga taagataatg     120

gccaaagaga atgacaatat ttccgaagta gatttactta agggtgttaa gttagttaaa     180

aatggttatg tttgtttagt aggtcttgtg gtgtcaggag agtggaattt acccgacaac     240

tgcagaggtg gtgtaagtat ctgtctgata gacaaacgta tgcaacgtca taacgaagct     300

actttaggtt cgtacactac caaagccagc aagaaaaact tttcgttcaa gcttataccg     360

aattactcga taacctctca agatgctgaa aggcgtcctt gggaagttat ggtaaatatt     420

cgtggtgtgg ctatgtccga aggttggtgt ccattatcct tagagttcgt ttctgtttgt     480

attgttcata aaaacaatgt tagaaagggt ctaagagaga aggtgactgc cgtgtccgaa     540

gacgacgcta tagaactcac agaagaggtt gttgatgagt ttatagaagc cgtaccgatg     600

gcgcgacgtt tgcagaactt gagaaaaccc aagtacaaca aagaaaaaga aaataaaaat     660

ttgaataata aaaatagtat aggagtttcc aaacctgtcg gtttggaaag aaataaagta     720

aggagtgtag ttagaaaagg ggttaggagt gatagtagtt taggtgtgac tgatatgagt     780

caggacggta gctcaagcga gatatcatcc gattcgttta ttt                       823


<210>  20
<211>  769
<212>  DNA
<213>  Tobacco mosaic virus-U2

<400>  20
atggctgtta gtctcagaga tactgtcaaa attagcgagt tcattgatct ttcgaaacag      60

gatgagatac ttccggcatt catgactaag gtcaagagcg tcagaatatc gactgtggac     120

aagattatgg ctgttaagaa tgatagtctt tctgatgtag atttacttaa aggtgttaag     180

ttagttaaga atgggtacgt gtgcttagct ggtttggtag tgtctgggga gtggaatctc     240

ccggacaact gccgtggtgg tgtcagtgtt tgtattgtag ataagagaat gaaaaggagt     300

aaggaggcaa cgctgggtgc gtatcacgcc cctgcttgca aaaagaattt ttcctttaag     360

ctaatcccta attattcaat aacatccgag gatgctgaga agcacccatg gcaagtatta     420

gtgaatatca aaggagtggc tatggaagaa ggatactgtc ctttatcttt ggagttcgtt     480

tcaatttgtg tagtacataa aaataatgta agaaaaggtt tgagggaacg tattttgaga     540

gtaacagacg gctcgccaat tgaactcact gaaaaagttg ttgaggagtt catagatgaa     600

gtaccaatgg ctgtgaaact cgaaaggttc cggaaaacaa aaaagagagt ggtaggtaat     660

agtgttaata ataagaaaat aaataatagt ggtaagaaag gtttgaaagt tgaggaaatt     720
```

gaggataatg taagtgatga cgagtctatc gcgtcatcga gtacgtttt 769

<210> 21
<211> 808
<212> DNA
<213> Artificial sequence

<220>
<223> Derived from ToMV & TMV-Cg by GRAMMR shuffling
in accordance with the methodogy of the present invention.

<400> 21
atggctctag ttgttaaagg taaggtaaat attaatgagt ttatcgatct gtcaaagtct 60

gagaaacttc tcccgtcgat gttcacgcct gtaaagagtg ttatggtttc aaaggttgat 120

aagattatgg tccatgaaaa tgaatcattg tctgaagtaa atctcttaaa aggtgtaaaa 180

cttatagaag gtgggtatgt ttgcttagtt ggtcttgttg tgtccggtga gtggaattta 240

ccagataatt gccgtggtgg tgtgagtgtc tgcatggttg acaagagaat ggaaagagcg 300

gacgaagcca cactggggtc atattacact gctgctgcta aaaagcggtt tcagtttaaa 360

gtggtcccaa attacggtat tactacaaag gatgcagaaa agaacatatg gcaagttcat 420

gtgcgtattc aaaatttaag gattgaagct ggatggcaac ctctggcctt agaggtggtt 480

tctgttgcta tggtcactaa taacgtggtt gttaagggtt tgagagaaaa ggtcatcgca 540

gtgaatgatc cgaatgtcga aggtttcgaa ggcgtggttg acgatttcgt cgattcggtc 600

gcagcattca aggcggttga cactttcaga aagaaaaaga aaaggattgg aggaaaggat 660

gtaaataata ataagtttag atatagaccg gagagatacg ccggtcagga ttcgttaaat 720

tataaagaag aaaacgtctt acaacatcac gaactcgaat cagtaccagt atttcgcagc 780

gacgtgggca gagcccacag cgatgctt 808

<210> 22
<211> 799
<212> DNA
<213> Artificial sequence
<220>
<223> Derived from ToMV & TMV-Cg by GRAMMR shuffling
in accordance with the methodogy of the present invention.

<400> 22
atgtcttacg agcctaaagt gagcgacttc cttgctctta cgaaaaagga ggaaatttta 60

cccaaggctc ttacgaggtt aaagactgtc tctattagta ctaaggatgt tatatctgtt 120

aaggattctg agtccctgtg tgatatagat ttactagtta atgtgccatt agataagtat 180

agatatgtgg gtgttttagg tgttgttttt accggtgagt ggaatttacc agataattgc 240

cgtggtggtg tgagtgtctg catggttgac aagagaatgg aaagagcgga cgaagccaca 300

ctggggtcat attacactgc tgctgcgaaa gacaaaaggt tccagttcaa gctggttcca 360 aattacttcg tgtctgttgc agatgccaag cgaaaaccgt ggcaagttca tgtgcgtatt 420

caaaatttaa ggattgaagc tggatggcaa cctctggcct tagaggtggt ttctgttgct 480

atggtcacta ataacgtggt tgttaagggt ttgagagaaa aggtcatcgc agtgaatgat 540

ccgaatgtcg aaggtttcga aggcgtggtt gacgatttcg tcgattcggt cgcagcattc 600

aaggcggttg acactttcag aaagaaaaag aaaaggattg gaggaaagga tgtaaataat 660

aataagttta gatatagacc ggagagatac gccggtcagg attcgttaaa ttataaagaa 720

gaaaacgtct tacaacatca cgaactcgaa tcagtaccag tatttcgcag cgacgtgggc 780

agagcccaca gcgatgctt 799

<210> 23
<211> 823
<212> DNA
<213> Artificial sequence

<220>
<223> Derived from from ToMV & TMV-Ob by GRAMMR shuffling
in accordance with the methodogy of the present invention.

<400> 23
aaataaacga atcggatgat atctcgcttg agctaccgtc ctgactcata tcagtcacac 60

ctaaactact atcactccta acccctttc taactacact ccttacttta tttctttcca 120

aaccgacagg tttggaaact cctatactat ttttattatt caaattttta ttttcttttt 180

ctttgttgta cttgggtttt ctcaagttct gcaaacgtcg cgccatcggt acggcttcta 240

taaactcatc aacaacctct tctgtgagtt ctatagcgtc gtcttcggac acggcagtca 300

ccttctctct tagacccttt ctaacattgt ttttatgaac aatacaaaca gaaacgaact 360

ctaaggataa tggacaccaa ccttcggaca tagccacacc acgaatattt accataactt 420

cccaaggacg cctttcagca tcttgagagg ttatcgagta attcggtata agcttgaacg 480

aaaagttttt cttgctggct ttggtagtgt acgaacctaa agtagcttcg ttatgacgtt 540

gcatacgttt gtctatcaga cagatactta caccacctct gcagttgtcg ggtaaattcc 600

actctcctga caccacaaga cctactaaac aaacataacc accttctata agttttacac 660

cttttaagag atttacttca gacaatgatt cattctcttt ggccattatc ttatccactg 720

ttgagactct gaccgacttc attcttgtga atgcagaagg taaaacctct tcagacttgg 780

ataatttaat gaattcatcg atcttgacaa tagcctttga cat 823

<210> 24
<211> 792
<212> DNA
<213> Artificial sequence

<220>

<223> Derived from from ToMV & TMV-Ob by GRAMMR shuffling
in accordance with the methodogy of the present invention.

<400> 24
aatacgaatc agaatccgcg accgacgtct cggcttcatc ttcaatcaaa ttatcaaact 60

ctttttcaac ttcatcaaaa ctttttggtt taggccttcc gcctgaacgc cccttaccta 120

aattattatt atttttcgga cctctttttg aggatttggt tcgaaacttt gcgagtctaa 180

ccgacattgg aacattctcc atgaactcat caacaacctc ttctgtgagt tctatagcgt 240

cgtcttcgga cacggcagtc accttctctc ttagaccctt tctaacattg tttttatgaa 300

caatacaaac agaaacgaac tctaatgaca aagggcagta gcccgcactc atttttacat 360

ttttaatatt tactaagacc tgccatatgt tcttttctgc atcctttgta gtaataccgt 420

aatttgggac cactttaaac tgaaaccgct ttttagcagc agcagtgtaa tatgacccca 480

gtgtggcttc gtccgctctt tccattctct tgtcaaccat gcagacactc acaccaccac 540

ggcaattatc tggtaaattc cactctcctg acaccacaag acctactaaa caaacataac 600

catttttaac taacttaaca cccttaagag atttacttcg gacaatgatt cattttcatg 660

gaccataatc ttatcaacct ttgaaaccat aacactcttt acaggcgtga atgcagaagg 720

taaaacctct tcagactttg acagatcgat aaactcatta atatttacct tacctttaac 780

aactagagcc at 792

<210> 25
<211> 769
<212> DNA
<213> Artificial sequence

<220>
<223> Derived from from ToMV & TMV-U2 by GRAMMR shuffling
in accordance with the methodogy of the present invention.

<400> 25
aatacgaatc agaatccgcg atagactcgt catcacttac attatcctca atttcctcaa 60

ctttcaaacc tttcttacca ctattattta ttttcttatt attaacacta ttacctacca 120

ctctcttttt tgttttccgg aacctttcga gtttcacagc cattggtact tcatctatga 180

actcatcaac aacttcttct gaaagttcca tgggtcctcc atcgttcaca ctcgttactt 240

tctccctcaa acccaatttt atattatttt tataaacaat acacacagac acaaattcta 300

aagataaagg gcagtatcct tcttccatag ccactccttt gatattcact aatacttgcc 360

atgggtgctt ttctgcatcc tcggatgtta ttgaataatt agggaccact ttaaactgaa 420

accgcttttt agcagcaggg gcgtgatacg cacccagcgt tgcctcctta ctcctttcca 480

ttctcttgtc aaccatgcag acactcacac caccacggca gttgtccggg agattccact 540

caccggacac aacaagacca actaagcaaa catacccacc ttctataagt tttacacctt 600

```
ttaagagatt tacttcagac aatgattcat tttcatggac cataatctta tcaacctttg    660

aaaccataac actctttaca ggcgtgaaca tcgacgggag aagtttctca gactttgaca    720

gatcgataaa ctcattaata tttaccttac ctttaacaac tagagccat               769


<210>  26
<211>  772
<212>  DNA
<213>  Artificial sequence

<220>
<223>   Derived from from ToMV & TMV-U2 by GRAMMR shuffling
        in accordance with the methodogy of the present invention.

<400>  26
aatacgaatc agaatccgcg accgacgtct cggcttcact tacattatcc tcaatttcct     60

caactttcaa aactttctta ccactattat ttattttctt attattaaca ctattaccta    120

ccactctctt ttttgttttc cggaaccttt cgagtttcac agccattggt acttcatcta    180

tgaactcatc aacaactttt tcagtgagtt caattggcga gccgtctgtt actctcaaaa    240

tacgttccct caaacccaat tttatattat ttttataaac aatacacaca gacacaaatt    300

ctaatgacaa agggcagtag cccgcactca tttttacatt tttaatattt actaagacct    360

gccatgggtg cttctcagca tcctcggatg ttattgaata attagggatt agcttaaagg    420

aaaaattctt tttgcaagca ggggcgtgat acgcacccag tgtggcttcg tccgctcttt    480

ccattctctt gtcaaccatg cagacactca caccaccacg gcagttgtcc gggagattcc    540

actcaccgga cacaacaaga ccaactaagc acacgtaccc attcttaact aacttaacac    600

ctttaagtaa atctacatca gacaatgatt cattttcatg gaccataatc ttatcaacct    660

ttgaaaccat aacactcttt acaggcgtga acatcgacgg gagaagtttc tcagactttg    720

acagatcgat aaactcgcta attttgacag tatctctgag actaacagcc at           772


<210>  27
<211>  805
<212>  DNA
<213>  Artificial sequence

<220>
<223>   Derived from from ToMV & TMV-U1 by GRAMMR shuffling
        in accordance with the methodogy of the present invention.

<400>  27
atggctctag ttgttaaagg aaaagtgaat attaatgagt ttatcgatct gtcaaagtct     60

gagaaacttc tcccgtcgat gttcacgcct gtaaagagtg ttatggtttc aaaggttgat    120

aagattatgg tccatgaaaa tgaatcattg tctgaagtaa atctcttaaa aggtgtaaaa    180

cttatagaag gtgggtatgt ttgcttagtt ggtcttgttg tgtccggtga gtggaattta    240

ccagataatt gccgtggtgg tgtgagtgtc tgcatggttg acaagagaat ggaaagagcg    300
```

```
gacgaagcca ctctcggatc ttactacaca gcagctgcaa agaaaagatt tcagttcaag     360

gtcgttccca attatgctat aaccacccag gacgcgatga aaaacgtctg gcaagtttta     420

gttaatatta gaaatgtgaa gatgtcagcg ggtttctgtc cgctttctct ggagtttgtg     480

tctgtgtgta ttgtttataa aaataatata aaattgggtt tgagggagaa agtaacgagt     540

gtgaacgatg gaggacccat ggaactttca gaagaagttg ttgatgagtt catggaagat     600

gtcccaatgt cggttagact cgcaaagttt cgatctcgaa ccggaaaaaa gagtgatgtc     660

cgcaaaggga aaaatagtag tagtgatcgg tcagtgccga acaagaacta tagaaatgtt     720

aaggattttg gaggaatgag ttttaaaaag aataatttaa tcgatgatga ttcggagacg     780

tcggtcgcgg attctgattc gtatt                                           805


<210>  28
<211>  804
<212>  DNA
<213>  Artificial sequence

<220>
<223>   Derived from from ToMV & TMV-U1 by GRAMMR shuffling
        in accordance with the methodogy of the present invention.

<400>  28
atggctctag ttgttaaagg aaaagtgaat atcaatgagt ttatcgacct gacaaagtct      60

gagaaacttc tcccgtcgat gtttacccct gtaaagagtg ttatggttcc aaagttgata     120

agattatggt tcatgagaat gagtcattgt caggggtgaa ccttcttaaa ggagttaagc     180

ttattgatag tggatacgtc tgtttagccg gtttggtcgt cacgggcgag tggaacttgc     240

ctgacaattg ccgtggtggt gtgagcgtgt gtctggtgga caagagaatg gaaagagcgg     300

acgaagccac actggggtca tattacactg ctgctgctaa aaagcggttt cagttcaagg     360

tcgttcccaa ttatgctata accacccagg atgcagaaaa gaacatatgg caggtcttag     420

taaatattaa aaatgtgaag atgagtgcgg gctactgccc tttgtcatta gaatttgtgt     480

cggtgtgtat tgtttataga aataatataa aattgggttt gagagagaaa gtaacgagtg     540

tgaacgatgg agggcccatg gaacttacag aagaagtcgt tgatgagttc atggaagatg     600

tccctatgtc gatcaggctt gcaaagtttc gatctcgaat cctcaaaaag agtgatgtcc     660

gcaaagggaa aaatagtagt agtgatcggt cagtgccgaa caagaactat agaaatgtta     720

aggattttgg aggaatgagt tttaaaaaga ataatttaat cgatgatgat tcggaggcta     780

ctgtcgcgga ttctgattcg tttt                                            804


<210>  29
<211>  717
<212>  DNA
<213>  Aequorea victoria GFP ORF
```

<400> 29
atgagtaaag gagaagaact tttcactgga gttgtcccaa ttcttgttga attagatggt 60

gatgttaatg ggcacaaatt ttctgtcagt ggagagggtg aaggtgatgc aacatacgga 120

aaacttaccc ttaaatttat ttgcactact ggaaaactac ctgttccatg gccaacactt 180

gtcactactt tctcttatgg tgttcaatgc ttttcaagat acccagatca tatgaaacgg 240

catgactttt tcaagagtgc catgcccgaa ggttatgtac aggaaagaac tatatttttc 300

aaggatgacg ggaactacaa gacacgtgct gaagtcaagt ttgaaggtga tacccttgtt 360

aatagaatcg agttaaaagg tattgatttt aaagaagatg gaaacattct tggacacaaa 420

ttggaataca actataactc acacaatgta tacatcatgg cagacaaaca aaagaatgga 480

atcaaagtta acttcaaaat tagacacaac attgaagatg gaagcgttca actagcagac 540

cattatcaac aaaatactcc aattggcgat ggccctgtcc ttttaccaga caaccattac 600

ctgtccacac aatctgccct ttcgaaagat cccaacgaaa agagagacca catggtcctt 660

cttgagtttg taacagctgc tgggattaca catggcatgg atgaactata caaataa 717

<210> 30
<211> 717
<212> DNA
<213> Artificial Sequence

<220>
<223> Plasmid encoding wild type Aequorea victoria GFP Cycle 3 ORF

<400> 30
atgagtaaag gagaagaact tttcactgga gttgtcccaa ttcttgttga attagatggt 60

gatgttaatg ggcacaaatt ttctgtcagt ggagagggtg aaggtgatgc tacatacgga 120

aagcttaccc ttaaatttat ttgcactact ggaaaactac ctgttccatg gccaacactt 180

gtcactactt tctcttatgg tgttcaatgc ttttcccgtt atccggatca tatgaaacgg 240

catgactttt tcaagagtgc catgcccgaa ggttatgtac aggaacgcac tatatctttc 300

aaagatgacg ggaactacaa gacgcgtgct gaagtcaagt ttgaaggtga tacccttgtt 360

aatcgtatcg agttaaaagg tattgatttt aaagaagatg gaaacattct cggacacaaa 420

ctcgagtaca actataactc acacaatgta tacatcacgg cagacaaaca aaagaatgga 480

atcaaagcta acttcaaaat tcgccacaac attgaagatg gatccgttca actagcagac 540

cattatcaac aaaatactcc aattggcgat ggccctgtcc ttttaccaga caaccattac 600

ctgtcgacac aatctgccct ttcgaaagat cccaacgaaa agcgtgacca catggtcctt 660

cttgagtttg taactgctgc tgggattaca catggcatgg atgaactata caaataa 717

<210> 31
<211> 3637

<212> DNA
<213> Artificial Sequence

<220>
<223> Plasmid encoding wild type Aequorea victoria GFP Cycle 3 ORF

<400> 31
gtggcacttt tcggggaaat gtgcgcggaa cccctatttg tttatttttc taaatacatt   60

caaatatgta tccgctcatg agacaataac cctgataaat gcttcaataa tattgaaaaa   120

ggaagagtat gagtattcaa catttccgtg tcgcccttat tccctttttt gcggcatttt   180

gccttcctgt ttttgctcac ccagaaacgc tggtgaaagt aaaagatgct gaagatcagt   240

tgggtgcacg agtgggttac atcgaactgg atctcaacag cggtaagatc cttgagagtt   300

ttcgccccga agaacgtttt ccaatgatga gcacttttaa agttctgcta tgtggcgcgg   360

tattatcccg tattgacgcc gggcaagagc aactcggtcg ccgcatacac tattctcaga   420

atgacttggt tgagtactca ccagtcacag aaaagcatct tacggatggc atgacagtaa   480

gagaattatg cagtgctgcc ataaccatga gtgataacac tgcggccaac ttacttctga   540

caacgatcgg aggaccgaag gagctaaccg cttttttgca caacatgggg gatcatgtaa   600

ctcgccttga tcgttgggaa ccggagctga atgaagccat accaaacgac gagcgtgaca   660

ccacgatgcc tgtagcaatg gcaacaacgt tgcgcaaact attaactggc gaactactta   720

ctctagcttc ccggcaacaa ttaatagact ggatggaggc ggataaagtt gcaggaccac   780

ttctgcgctc ggcccttccg gctggctggt ttattgctga taaatctgga gccggtgagc   840

gtgggtctcg cggtatcatt gcagcactgg ggccagatgg taagccctcc cgtatcgtag   900

ttatctacac gacggggagt caggcaacta tggatgaacg aaatagacag atcgctgaga   960

taggtgcctc actgattaag cattggtaac tgtcagacca agtttactca tatatacttt   1020

agattgattt aaaacttcat ttttaattta aaaggatcta ggtgaagatc ctttttgata   1080

atctcatgac caaaatccct taacgtgagt tttcgttcca ctgagcgtca gaccccgtag   1140

aaaagatcaa aggatcttct tgagatcctt tttttctgcg cgtaatctgc tgcttgcaaa   1200

caaaaaaacc accgctacca gcggtggttt gtttgccgga tcaagagcta ccaactcttt   1260

ttccgaaggt aactggcttc agcagagcgc agataccaaa tactgtcctt ctagtgtagc   1320

cgtagttagg ccaccacttc aagaactctg tagcaccgcc tacatacctc gctctgctaa   1380

tcctgttacc agtggctgct gccagtggcg ataagtcgtg tcttaccggg ttggactcaa   1440

gacgatagtt accggataag gcgcagcggt cgggctgaac ggggggttcg tgcacacagc   1500

ccagcttgga gcgaacgacc tacaccgaac tgagatacct acagcgtgag ctatgagaaa   1560

gcgccacgct tcccgaaggg agaaaggcgg acaggtatcc ggtaagcggc agggtcggaa   1620

caggagagcg cacgagggag cttccagggg gaaacgcctg gtatctttat agtcctgtcg   1680 ggtttcgcca cctctgactt gagcgtcgat ttttgtgatg ctcgtcaggg gggcggagcc 1740

tatggaaaaa cgccagcaac gcggcctttt tacggttcct ggccttttgc tggccttttg 1800

ctcacatgtt ctttcctgcg ttatcccctg attctgtgga taaccgtatt accgcctttg 1860

agtgagctga taccgctcgc cgcagccgaa cgaccgagcg cagcgagtca gtgagcgagg 1920

aagcggaaga gcgcccaata cgcaaaccgc ctctccccgc gcgttggccg attcattaat 1980

gcagctggca cgacaggttt cccgactgga aagcgggcag tgagcgcaac gcaattaatg 2040

tgagttagct cactcattag gcaccccagg ctttacactt tatgcttccg gctcgtatgt 2100

tgtgtggaat tgtgagcgga taacaatttc acacaggaaa cagctatgac catgattacg 2160

ccaagcgcgc aattaaccct cactaaaggg aacaaaagct gggtaccgat gagtaaagga 2220

gaagaacttt tcactggagt tgtcccaatt cttgttgaat tagatggtga tgttaatggg 2280

cacaaatttt ctgtcagtgg agagggtgaa ggtgatgcaa catacggaaa acttaccctt 2340

aaatttattt gcactactgg aaaactacct gttccatggc caacacttgt cactactttc 2400

tcttatggtg ttcaatgctt ttcaagatac ccagatcata tgaaacggca tgactttttc 2460

aagagtgcca tgcccgaagg ttatgtacag gaaagaacta tatttttcaa ggatgacggg 2520

aactacaaga cacgtgctga agtcaagttt gaaggtgata cccttgttaa tagaatcgag 2580

ttaaaaggta ttgattttaa agaagatgga aacattcttg gacacaaatt ggaatacaac 2640

tataactcac acaatgtata catcatggca gacaaacaaa agaatggaat caaagttaac 2700

ttcaaaatta gacacaacat tgaagatgga agcgttcaac tagcagacca ttatcaacaa 2760

aatactccaa ttggcgatgg ccctgtcctt ttaccagaca accattacct gtccacacaa 2820

tctgcccttt cgaaagatcc caacgaaaag agagaccaca tggtccttct tgagtttgta 2880

acagctgctg ggattacaca tggcatggat gaactataca aataagaatt cctgcagccc 2940

gggggatcca ctagttctag agcggccgcc accgcggtgg agctccaatt cgccctatag 3000

tgagtcgtat tacgcgcgct cactggccgt cgttttacaa cgtcgtgact gggaaaaccc 3060

tggcgttacc caacttaatc gccttgcagc acatccccct ttcgccagct ggcgtaatag 3120

cgaagaggcc cgcaccgatc gcccttccca acagttgcgc agcctgaatg gcgaatggga 3180

cgcgccctgt agcggcgcat taagcgcggc gggtgtggtg gttacgcgca gcgtgaccgc 3240

tacacttgcc agcgccctag cgcccgctcc tttcgctttc ttcccttcct ttctcgccac 3300

gttcgccggc tttccccgtc aagctctaaa tcgggggctc cctttagggt tccgatttag 3360

tgctttacgg cacctcgacc ccaaaaaact tgattagggt gatggttcac gtagtgggcc 3420

atcgccctga tagacggttt ttcgcccttt gacgttggag tccacgttct ttaatagtgg 3480

actcttgttc caaactggaa caacactcaa ccctatctcg gtctattctt ttgatttata 3540

agggattttg ccgatttcgg cctattggtt aaaaaatgag ctgatttaac aaaaatttaa 3600 cgcgaatttt aacaaaatat taacgcttac aatttag 3637

<210> 32
<211> 3637
<212> DNA
<213> Artificial Sequence

<220>
<223> Plasmid containing cycle 3 BFP gene

<400> 32
gtggcacttt tcggggaaat gtgcgcggaa cccctatttg tttatttttc taaatacatt 60

caaatatgta tccgctcatg agacaataac cctgataaat gcttcaataa tattgaaaaa 120

ggaagagtat gagtattcaa catttccgtg tcgcccttat tccctttttt gcggcatttt 180

gccttcctgt ttttgctcac ccagaaacgc tggtgaaagt aaaagatgct gaagatcagt 240

tgggtgcacg agtgggttac atcgaactgg atctcaacag cggtaagatc cttgagagtt 300

ttcgccccga agaacgtttt ccaatgatga gcacttttaa agttctgcta tgtggcgcgg 360

tattatcccg tattgacgcc gggcaagagc aactcggtcg ccgcatacac tattctcaga 420

atgacttggt tgagtactca ccagtcacag aaaagcatct tacggatggc atgacagtaa 480

gagaattatg cagtgctgcc ataaccatga gtgataacac tgcggccaac ttacttctga 540

caacgatcgg aggaccgaag gagctaaccg cttttttgca caacatgggg gatcatgtaa 600

ctcgccttga tcgttgggaa ccggagctga atgaagccat accaaacgac gagcgtgaca 660

ccacgatgcc tgtagcaatg gcaacaacgt tgcgcaaact attaactggc gaactactta 720

ctctagcttc ccggcaacaa ttaatagact ggatggaggc ggataaagtt gcaggaccac 780

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Leu Thr Cys Met Val Ala Glu Pro Phe Leu Ser Ser Glu Ser Lys Gln
35 40 45

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Ala Val Glu Glu Leu Leu Ser Gly Arg Asp Leu Pro Asp Leu Cys Ser
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Trp Ala Asp Gln Ile Arg Arg Ser Tyr Lys Phe Arg Trp Thr Gly Pro
65                  70                  75                  80


Leu His Tyr Ile Asp Thr Pro Asp Asn Leu Cys Thr Tyr Asp Tyr Asp
                85                  90                  95


Arg Asp Cys His Asp Ser His Gly Lys Lys Asp Val Cys Val Ala Gly
            100                 105                 110


Gly Ile Asn Asn Tyr Ser Ser Gln Leu Glu Thr Phe Leu Asp Ser Glu
        115                 120                 125


Ser Ser Ser Tyr Asn Leu Thr Glu Ala Leu Leu Phe Leu Ala His Phe
    130                 135                 140


Val Gly Asp Ile His Gln Pro Leu His Val Ala Phe Thr Ser Asp Ala
145                 150                 155                 160


Gly Gly Asn Gly Val His Val Arg Trp Phe Gly Arg Lys Ala Asn Leu
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His His Val Trp Asp Thr Glu Phe Ile Ser Arg Ala Asn Arg Val Tyr
            180                 185                 190


Tyr His Asp Ile Ser Lys Met Leu Arg Asn Ile Thr Arg Ser Ile Thr
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Lys Lys Asn Phe Asn Ser Trp Ser Arg Cys Lys Thr Asp Pro Ala Ala
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Cys Ile Asp Ser Tyr Ala Thr Glu Ser Ile Asp Ala Ser Cys Asn Trp
225                 230                 235                 240


Ala Tyr Lys Asp Ala Pro Asp Gly Ser Ser Leu Asp Asp Asp Tyr Phe
                245                 250                 255


Ser Ser Arg Leu Pro Ile Val Glu Gln Arg Leu Ala Gln Gly Gly Val
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Arg Leu Ala Ser Ile Leu Asn Arg Ile Phe Gly Gly Ala Lys Ser Asn
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Arg Ser Ser Arg Ser Ser Met
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His Phe Arg


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